U.S. DEPARTMENT OF COMMERCE
National Telecommunications & Information Administration

Evaluation of the
Telecommunications and Information Infrastructure Assistance Program

Case Study Report

Project NETmobile
95137

Edinburg, Texas

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PREFACE

On behalf of the National Telecommunications and Information (NTIA), I am pleased to share the following report that is one of a series of case studies conducted on grants awarded by the Telecommunications and Information Infrastructure Assistance Program (TIIAP) in 1994 and 1995. The case studies are part of the program's evaluation effort designed to gain knowledge about the effects and lessons of TIIAP-funded projects. NTIA contracted Westat, a research and consulting firm, to perform an independent evaluation of the program's first two years of grants. The evaluation consisted of a mail survey of 206 grant recipient organizations and in-depth case studies of selected projects. In February, 1999, the Commerce Department released Westat's evaluation report.

The projects selected for the case studies cover a broad range of program types and sizes, planning grants as well as demonstration grants, and they show varying degrees of implementation, sustainability, and replication. Westat selected the projects to represent a cross-section of all projects funded in the program's first two years. Specific selection criteria included geographic region, target population, project application area, project category, and size of award. To conduct each case study, Westat reviewed all project files, including progress reports and the final report, and conducted site visits. The site visits consisted of project demonstrations and interviews with project staff, representatives of partner organizations, and project end users.

NTIA thanks the case study participants for their time and their willingness to share not only their successes but their difficulties, too. Most of all, we applaud their pioneering efforts to bring the benefits of advanced telecommunications and information technologies to communities in need. We are excited about the case studies and lessons they contain. It is through the dissemination of these lessons that we extend the benefits of TIIAP-funded projects nationwide.

We hope you find this case study report valuable and encourage you to read other TIIAP case studies. You may obtain additional case studies and other TIIAP publications, including the final Westat evaluation report, through the NTIA web site (www.ntia.doc.gov) or by calling the TIIAP office at (202) 482-2048. We also are interested in your feedback. If you have comments on this case study or suggestions on how TIIAP can better provide information on the results and lessons of its grants, please contact Francine E. Jefferson, Ph.D. at (202) 482-2048 or by email at fjefferson@ntia.doc.gov.

Larry Irving
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TIIAP CASE STUDY

Project NETmobile

A. EXECUTIVE SUMMARY

The NETmobile is an extension of the bookmobile concept. It was designed to provide Internet access and exposure to the residents in rural and remote areas of the Rio Grande Valley of South Texas. The NETmobile's primary purpose is to raise awareness of the value of advanced telecommunications technologies by providing firsthand exposure to bulletin board systems, the Internet, and the World Wide Web. A secondary purpose is to provide Internet training and information to residents in the region.

The grant recipient is the Office of Center Operations and Community Services (CoSERVE), a public service division of the University of Texas-Pan American (UTPA). Under CoSERVE, there are 15 public service outreach centers. The Center for Entrepreneurship and Economic Development (CEED) was the leader in developing the NETmobile. Hughes Electronics Corporation, a world leader in the design and manufacturing of advanced electronics systems, was the primary partner for this TIIAP project. Hughes donated the satellite dish, personal earth station, maintenance support, and satellite transmission time for the duration of the project. They have continued their support as NETmobile goes into its fourth year of operation. Hughes is currently providing an average of $60,000-80,000 a year to support the project.

Several other companies and organizations donated hardware and services to the NETmobile. Dell Corporation donated eight 486 computers; Intel donated nine proshare units (video-conferencing equipment that mount on the computers inside the NETmobile); ACS Dataline did the wiring of the NETmobile, Southwestern Bell donated monies to help with costs associated with the truck and trailer; and the Council for South Texas Economic Progress Program (COSTEP), a non-profit corporation, distributed educational software.

The NETmobile is an impressive technological accomplishment in its own right. The mobile unit provides direct uplink and downlink capability utilizing satellite technology. Installed on each of the computers is video-conferencing equipment to enhance discussions via the Internet by providing visual communication.

The project positively impacted both groups of end users: the education community including teachers, administrators, parents; and community members including elected officials, businesspersons, ranchers, and farmers. During conversations with project staff and with end users, we learned about several ways in which citizens in the region benefited from being exposed to the Internet via the NETmobile.

B. OVERVIEW

Purpose and General Approach

The NETmobile is an extension of the bookmobile concept. It was designed to provide Internet access and exposure to the residents in rural and remote areas of the Rio Grande Valley of South Texas. The NETmobile's primary purpose is to raise awareness of the value of advanced telecommunications technologies by providing firsthand exposure to bulletin board systems, the Internet, and the World Wide Web. A secondary purpose is to provide Internet training and information to residents in the region. Since

receiving the 14-month demonstration grant in October 1995, the University of Texas-Pan American (UTPA) has worked to develop and ensure the continued success of the NETmobile. The project targets two main categories of end users:

1. General community members including government officials, business owners, and farmers, and

2. The education community including parents, teachers, and students at all levels from pre-kindergarten through college.

The NETmobile is equipped with nine Pentium-based computers and state-of-the-art, two-way satellite transmission. The 38-foot diesel-generated trailer travels the rural roads of Southern Texas to educate residents at prearranged stops. The NETmobile is unique in the world in offering a fully mobile two-way satellite Internet transmission system that operates completely free of ISDN lines. This capability is important because the remote and rural locations being served are not equipped with ISDN lines. With respect to the speed of data transfer and reliability of data, the two-way satellite connection has far exceeded the expectations of the project staff. And the short setup time, typically 30-40 minutes, has made the NETmobile very convenient.

The University of Texas-Pan American has established a continuing partnership with Hughes Electronics Corporation. In response to a request from UTPA, Hughes developed the mobile two-way satellite system and donated it to the TIIAP project to pilot test the equipment and to garner public relations. Maintenance and transmission costs have been paid for by Hughes since the beginning of the project, and Hughes plans to continue providing this level of support indefinitely. Due to the high maintenance and transmission costs associated with the satellite system, the project would not have been possible without Hughes' support.

The project's goal was to serve 4,000 residents during the 14-month project period. This goal was exceeded in that 4,234 businesspersons, government officials, and students were served during the project duration.

Description of Grant Recipient and Project Partners

Grant Recipient. The University of Texas-Pan American joined the University of Texas system in 1989. They are a regional institution serving 12,500 students. Prior to affiliating with the University of Texas, the university had an open admissions policy that allowed everyone to take courses. After joining the University of Texas system, the open admissions policy ended, leaving many South Texas residents without access to higher education courses. A 2-year college, South Texas Community College (STCC), recently opened in order to meet the needs of students unable to get into UTPA.

The Office of Center Operations and Community Services (CoSERVE) is a public service division of the UTPA. It serves as a national model for economic and community development. The center provides education and training to improve the quality of life in the Rio Grande Valley and provides innovative solutions to economic challenges. Under CoSERVE, there are 15 public service outreach centers. The Center for Entrepreneurship and Economic Development (CEED) was the leader in developing the NETmobile. Within CoSERVE, CEED is the catalyst for business and economic development through the development of public and private partnerships. Other centers have worked in different capacities with the NETmobile project. These include the One Stop Capital Shop (OSCS), which helps clients create, retain, and development businesses within the Rio Grande Valley empowerment zone

by providing free technical and business assistance. Another center is the Community Outreach Partnership Center (COPC), which helps mobilize community resources for self-help activities in rural communities. Other CoSERVE centers are Center for Manufacturing (CFM), Industrial Partnership Center (IPC), Center for Continuing Education (CCE), National Center of Excellence (NCE), Center for Local Government (CLG), The EDA University Center, International Trade and Technology Center (IT2), Data and Information Systems Center (DISC), Mexican Business Information Center (MBIC), Small Business Development Center (SBDC), South Texas Minority Business Opportunity Committee (MBOC), and Southwest Border Nonprofit Resource Center (SBNRC).

NETmobile staff. The key staff members included:

- Project director, responsible for inception of the idea and coordinating staff and resources. He is the executive director of CoSERVE.

- Project coordinator, responsible for scheduling, daily administration, public relations. He is the director of economic development under CoSERVE.

- Budget manager, responsible for accounting. He is the associate executive director of CoSERVE.

- NETmobile engineer, responsible for the design and construction of the NETmobile. He is the director of the Center of Manufacturing under CoSERVE. Before coming to the university, he worked with IBM in research and development in engineering.

- Another important member of the NETmobile staff is a part-time graduate student that took over many tasks when a full-time staff member left the university early in the project. He is currently the senior LAN administrator for CoSERVE.

At the onset of the project, it was thought that one full-time staff member would be sufficient to operate the NETmobile, but this approach had to be changed halfway through the project. After several NETmobile trips, project staff realized that the assignment required two full-time people to conduct the NETmobile site visits. Each of the two NETmobile operators has additional responsibilities at the university, but their primary duty is to operate the NETmobile. One operator drives and maintains the vehicle. The other operator is a computer specialist who is responsible for keeping the computers and satellite transmission system in working order.

Project Partners. Hughes Electronics Corporation, the primary partner for this TIIAP project, is a world leader in the design and manufacturing of advanced electronics systems. It was founded in 1985 when General Motors Corporation purchased Hughes Aircraft Company. Five subsidiaries comprise Hughes Electronics: Hughes Space and Communication company, Hughes Network Systems, Inc, DirecTV, Inc, Hughes Communications, Inc, and PanAmSat Corporation. They operate 17 state-of-the-art satellites that provide global satellite-based communication services and Internet access. Hughes donated the satellite dish, personal earth station, and satellite access time for the duration of the project. They have continued their support as the NETmobile enters its fourth year of operation. Hughes has committed to providing about $60,000-80,000 a year for the NETmobile's satellite transmission fees.

Several companies donated hardware to the NETmobile. Dell Corporation donated eight 486 computers at the start of the NETmobile project, and in June 1996 upgraded the computers with Pentium processors. Intel donated nine proshare units, which are a type of video-conferencing equipment that can be mounted on the computers inside the NETmobile.

In order to make the NETmobile operational, other companies donated time and monies to outfitting the trailer for the computers. ACS Dataline did the wiring of the NETmobile. Southwestern Bell donated monies to help with the costs associated with the truck and trailer.

Project Costs

Federal expenditures totaled $166,535.43, including

- $128,654.46 for equipment;
- $1,398.90 for supplies;
- $29,360.42 for operating costs; and
- $7,121.65 for travel.

Nonfederal expenditures totaled 178,446.77, including

- $26,952.12 from UTPA for personnel;
- $8,355.15 from UTPA for fringe benefits;
- $73,094.00 from ACS Dataline (cabling), Intel (proshares), Dell Computers (computers), and Southwestern Bell (trailer) for equipment;
- $58,108.00 from Hughes Network Systems for satellite time;
- $11,937.50 from UTPA for in-kind softshare and office space;

C. PROJECT CONTEXT

Community Description

The NETmobile project was designed to serve the Rio Grande Empowerment Zone, a four-county, 1,000-square-mile region with a population of about 30,000. The Empowerment Zones were created through federal legislation to allow selected areas were to receive additional assistance and benefits and to become laboratories for innovation. By waiving certain federal regulations, new approaches were created to encourage community and economic development in these Empowerment Zones. Only six urban and three rural areas received designation after submitting a detailed strategic plan, which included four key principles: economic opportunity, sustainable community development, community-based partnerships, and strategic vision for change. The Rio Grande Valley Chamber of Commerce took an administrative role in obtaining empowerment zone designation but many of the ideas for change came from grass roots meeting held in the communities. The result was a plan to include job training, house building, health care, and business development. These processes build new relationships and strengthened the existing ties. On December 21, 1994, the Rio Grande Valley received designation from President Clinton as a rural empowerment zone.

The four county areas of the Rio Grande Valley—Hidalgo, Cameron, Willacy, and Starr—have areas designated in the empowerment zone. The zone has at least 50 percent below the poverty level and 30 percent unemployment rate. Each county ranks at the bottom of almost every socioeconomic indicator with more than 35 percent of their residents living below the poverty level. The official unemployment rates range from 17 to 23 percent, and the average educational attainment level is only 6.7 grade level. Within the designated Empowerment Zone areas lie "colonias" or rural ghettos, in which people live in absolute poverty, without running water, electricity, or garbage disposal. In Texas, more than 100,000 people live in such conditions.

Maquiladoras are another unique characteristic found in border towns. They are "twin plants" one on each side of the border. They utilize the cheap labor in Mexico and set up their twin plant in the U.S. to send the assembled parts. Maquiladoras are currently a $21 billion industry and are rapidly becoming a leading source of economic development in the Rio Grande Valley. With the passage of NAFTA in 1993, Southern Texas has become the center of the world's largest trading block, and many people believe that the state's economy should be booming. Yet in reality there is a severe lack of employment in the border areas that were intended to benefit the most from the trade agreement.

Status of Telecommunication Information Infrastructure Environment Prior to the TIIAP Project

Texas has been working hard to improve the status of its telecommunications infrastructure. For example, a House bill was passed to encourage schools to improve their use of technology. This bill reduced the price for T1 service for educational institutions throughout the state. Despite these efforts, the Rio Grande Valley remains a poor and impoverished area whose residents have little means for accessing technology. Few telecommunication activities exist outside of institutions like the University of Texas Pan American. It was evident during the site visit that the University is taking a lead role in advancing the development of a telecommunications and information infrastructure in the region. In fact, at that time, the university was preparing to dedicate a new technology building that was partially funded by the Department of Commerce's Economic Development Administration.

Other Community Characteristics

During our visit, we talked with a local high school teacher who provided information about his high school that is typical of most in the area. The high school is composed of 90-95 percent Hispanic students and although most come from lower middle class families, the school has a high percentage of students living in extreme poverty. Internet access is located in the libraries at the school and open access labs. The facilities are open to all, but they require students receive training on the computers before using them. Two of the labs are under the business and technology department and the migrant program has it own computer lab for students. Many of the students were familiar with the World Wide Web, but the usage at the school is very limited and restricted. Many of the computers are old and do not handle Internet connections. These conditions make it difficult to help students learn about technology and become prepared to join a society that is becoming so dependent on computers and the Internet.

D. PROJECT IMPLEMENTATION

Activities/Milestones that Occurred Prior to the TIIAP Grant Period

Prior to the TIIAP grant, UTPA researched and investigated the NETmobile. CoSERVE staff put a great deal of energy into researching the technological aspects of the NETmobile and establishing the

necessary partnerships. The NETmobile was originally intended to travel short distances within the Rio Grande Valley, so little attention was given to long distance travel considerations.

Activities/Milestones that Occurred During the TIIAP Grant Period

Once the grant was awarded in October 1995, the staff began assembling the NETmobile. The Manufacturing Center was responsible for the logistical aspects of getting the NETmobile on the road. Staff met with local truck dealers to determine the best approaches for the design of NETmobile's truck and trailer. They also met with representatives from Southwestern Bell to request assistance with the provision of telecommunication lines for networking. Southwestern Bell Communications funded the procurement of the trailer and related accessories. A local manufacturer installed the interior of the trailer, which included power lines/outlets, generator for the trailer, wall-to-wall anti-static carpet, shelves, and desks for the computers.

Providing a reliable power source was one of the most difficult challenges facing the engineering team that designed and assembled the NETmobile because 110 circuits were necessary to keep the computers and air conditioning running. Hughes Network Systems ensured that the procurement, installation, and utilization of the satellite was problem free by donating the satellite system, providing excellent technical assistance, and paying all satellite transmissions costs for accessing the Internet. As evidence of their commitment to the project, Hughes sent a team of engineers to the project site at no cost to the University in order to provide training on setting up the computers and maintenance on the satellite. Dell Corporation donated eight workstations in January 1996 that were installed in the trailer. In conjunction with the NETmobile's development, a home page was established on the World Wide Web to describe the NETmobile project.

During the grant period, the NETmobile visited numerous sites and reached over 4,000 people. The following is a list of some of the major sites the NETmobile visited along with a brief explanation of the activities conducted on each visit.

July

- The NETmobile made its first trip on July 21, 1996, to Austin, Texas. The NETmobile was demonstrated to top management of Dell computers including the company's CEO, Michael Dell. Forty visitors used the NETmobile that first day.

- On July 22, the NETmobile traveled to Arlington, Texas, to participate in the Technology in Higher Education conference, sponsored by the U.S. Department of Commerce's Economic Development Administration (EDA). Over 150 participants from various community colleges and universities visited the NETmobile.

- The NETmobile also traveled to Round Rock to make a presentation for over 70 staff members of Dell computers.

August

- On August 5, the NETmobile was part of an Open House at UTPA to announce the opening of the One Stop Capital Shop. Over 150 people to visited the NETmobile.

- On August 19, the President's Council at UTPA visited the NETmobile along with the Mexican consulate.

September

- On September 16, board members from the South Texas Higher Education Authority (STHEA) visited the NETmobile.

- On September 23, the UTPA Foundation's Board of Trustees visited the NETmobile along with approximately 100 UTPA students.

October

- On October 10, the NETmobile made its first rural visit to Kika de la Garza Elementary School. Seventy-five students from the fourth grade had an opportunity to explore the Internet. A local congressman gave a presentation to the students and teachers about the importance of technology in education.

- On October 14, the President and CEO of Southwestern Bell Corporation and 18 area managers received a demonstration on the NETmobile.

- Seventy students participated in Internet training at Weslaco High School through the Business Education Department on October 16.

- On October 24 and 25, the Rio Grande Valley Rural Empowerment Zone sponsored a 2-day conference in McAllen. All 120 participants visited the NETmobile.

- On October 26, the Rio Grande Valley Empowerment Zone and Region One-Education Service Center sponsored a Tech Day for 19 schools in the Rio Grande Valley. The NETmobile was demonstrated to school superintendents, teachers, students, and other officials.

November

- On November 7, the NETmobile went to South Padre Island and gave a demonstration to officials in the UTPA Office of the Vice President for Business Affairs.

- On November 11, the NETmobile traveled to a rural empowerment zone and presented to school board members, staff, and teachers in Sebastian and Willacy Counties.

- On November 13, the NETmobile traveled to Pace High School in Brownsville, where 80 students and teachers visited the NETmobile and explored the Internet.

January-March, 1997

- During this 3-month period, the NETmobile traveled to over 70 schools in the 19 southernmost counties of Texas. Students in these schools were able to apply for financial aid on-line. Approximately 800 students logged in on the Internet and searched for information on colleges and universities.

- The NETmobile also visited the Harlingen Area Chamber of Commerce and made a demonstration for 18 participants of a leadership class that was being hosted by Southwestern Bell.

- At the ground breaking of the International Trade and Technology Building at the UTPA campus, the NETmobile was demonstrated to about 200 invitees including congressmen and other important officials.

- The NETmobile was sent to the Annual State Conference for the Texas Guaranteed Student Loan Corporation during the third week of March. About 100 people visited the NETmobile.

April - June, 1997

- The NETmobile traveled to several public schools during the 3-month period; 550 students visited the NETmobile, and some of the students receive assistance completing an online financial aid application. Other visitors during this time were elected officials, business people, and community leaders from surrounding cities. During one school visit, the NETmobile had 110 local residents visit.

- The NETmobile traveled to San Antonio for the Economic Development Administration conference; 295 conference attendees and 185 walk-ins visited the NETmobile.

- In June, UTPA hosted the Southwestern Border Regional Conference attended by Vice President Gore and other government officials. Nearly 300 conference participants visited the NETmobile.

Steps Taken to Sustain Project Activities Beyond the TIIAP Grant Period

The structure, frame, and power supply for the NETmobile trailer have continually been improved to accommodate changing expectations for the NETmobile. Hughes provided numerous resources that enabled the NETmobile to remain operable beyond the grant period. They upgraded the computers from 486's to Pentiums, installed a new satellite feed horn, and continued to provide free satellite time. According to the project director, UTPA would not be able to continue to operate the NETmobile without the support from Hughes.

Activities/Milestones That Occurred After the TIIAP Grant Period

After the grant period, the NETmobile continued to visit schools in the Rio Grande Valley including McAllen High School, Memorial Middle School, and Edinburg High School. The NETmobile has also visited many conferences both locally and across the country. Immediately following the grant period, the NETmobile was demonstrated at several business seminars conducted by the One Stop Capital Shop. During these business seminars, 60 people visited the NETmobile at the rural sites and 40 people at Rio Grande City. The director felt that some of the more rural communities have a better response because that is where the assistance is most needed. The Department of Commerce invited the NETmobile to attend a MEDWeek conference in Washington, DC, on November 19-22, 1997. They were invited to another demonstration in Detroit that Vice President Al Gore attended, but the NETmobile was not sent due to security issues.

Issues

Changes in the original proposed plan surfaced as the grant recipients learned of new and better technology. Originally, cellular service was proposed as the method of connecting the mobile unit to the Internet. But limitations such as interference and lack of service in rural areas would present problems. Satellite transmission was considered, but the vehicle needed 100 percent uplink and downlink from the same satellite, and available satellite equipment offering these capabilities could not be used on a mobile setup. However, during discussions with engineers at Hughes Electronics in Gaithersburg, Maryland, engineers in the R&D division expressed an interest in developing a mobile satellite transmission system and beta-testing it on the NETmobile. Therefore, instead of staying with the cellular technology originally proposed in the grant, project staff decided to try the two-way satellite system developed by Hughes, thereby making the project even more innovative than originally conceived.

Other changes in the plan had to do with partnerships. IBM was originally approached to donate computers to the NETmobile project because the engineer on the NETmobile had worked with IBM for 18 years prior to coming to UTPA and therefore had a good relationship with IBM. However, IBM was unable to meet the short timeline, and UTPA turned to Dell for assistance. Dell was willing and able to provide the computers without any delay. Another change in the hardware from the original proposal involved reducing the number of computers in the trailer and installing Intel Proshare video-conferencing units. During our visit, the video-conferencing units were not mounted on the computer because they were taken out of the trailer for renovations and had not yet been re-installed.

Designing the NETmobile. Designing the NETmobile was difficult because the staff had a hard time visualizing of how the NETmobile should look and function. Because the NETmobile is a unique endeavor, there were no prototypes to model. Another issue that surfaced long after the NETmobile was operational was the vehicle did not meet the specifications of American Disabilities Act (ADA) regulations. Project staff were required to comply with ADA regulations that stipulated adding a wheel chair accessible door to the rear of the NETmobile.

Problems

For the most part, the problems faced by the NETmobile staff were low-tech issues. The original generator was insufficient to power the vehicle's computers, air conditioning, and other electricity usage. The original generator was a prototype that had been developed for the needs associated with the NETmobile. It was replaced free of charge after it failed to work properly, but UTPA had to lease a generator for several trips. A related problem concerned the acoustics inside the trailer. Because presentations were given inside the trailer, the amount noise created by the generator was causing problems. A special sound absorbing room had to be constructed on the trailer to minimize sound from the generator.

Security of the NETmobile has been a frequent problem during site visits. While on campus, the NETmobile is housed in a secured, fenced-in area at the university's maintenance plant. During site visits, the site is responsible for providing either a fenced-in area for parking (if overnight) or 24-hour surveillance. If the site cannot provide adequate security for the NETmobile, project staff are forced to drive back to the university. The trailer has never been vandalized, but its hubcaps were taken while the NETmobile was visiting Washington, DC.

The satellite antenna caused problems because it was mounted on top of the trailer and the high wind velocities during travel made the dish very unstable. University engineers designed a retractor to allow the dish to lay flatter on the top of the trailer. Another problem associated with the dish was that

strong winds sometimes caused the satellite to disconnect during use. This problem was solved by reinforcing the bottom of the antenna mounting and adding a windshield to the top of the trailer.

E. PROJECT ACCOMPLISHMENTS AND IMPACT

Technology-Related Accomplishments

> *The impact has been strong and positive. South Texas is always a few steps behind in technology yet with the NETmobile [we] moved beyond most others because of the satellite technology.*

The development of the NETmobile itself is a unique and fascinating technological achievement. The mobile unit can provide direct uplink and downlink Internet connectivity from almost anywhere on the planet utilizing satellite technology. Video-conferencing equipment to enhance Internet communications with real-time visual communications capabilities is installed on each of the computers

Impact of the Project on Direct End Users

According to the project staff, the NETmobile was designed to educate and inform citizens in rural areas as to the benefits of technology and the Internet. This project was directed at two groups of end users: (1) the education community including students, teachers, administrators, and parents, and community members including elected officials, businesspersons, ranchers, and farmers. Each of the staff members we met with gave accounts of how the NETmobile has positively impacted those who have experienced it.

Direct end users at schools are the students and teachers. Many of the teachers that requested the NETmobile had developed lesson plans around the visit. Some teachers had students use the Internet to access information on college and universities; other schools had students learn about different careers through the Internet. Overall, the NETmobile enabled students to use technology not previously accessible to them.

One example of how schools use the NETmobile to benefit students is through the COSTEP program. COSTEP is a nonprofit corporation that provides financial aid assistance for students. They are the fiscal agents for the state's Empowerment Zones. Students at every high school in an empowerment zone receive software developed by the U.S. Department of Education that enables students to complete and submit Federal Assistance for Student Financial Aid applications through the Internet. However, most high schools in the empowerment zones do not have adequate Internet capabilities to fully utilize the financial aid software. The NETmobile has been employed at COSTEP's request to visit high schools in the local empowerment zone and help students electronically apply for financial aid. The electronic application procedure reduces the time required for processing the financial aid forms from approximately 10 days to 6 weeks.

A local high school teacher related another example of the direct impact the NETmobile has had on students in the area. He teaches the course Career Connections, an elective for 9th and 10th grade students in which they discuss the seven career pathways that have been defined by the State of Texas. In collaboration with his students and the school's technology coordinator, the teacher organized a Career Day Expo for all students in the school. The teacher first saw the NETmobile at a demonstration for the One Stop Capital Shop on the UTPA campus and believed it could provide an important opportunity for his students to use the Internet. During the Career Day Expo, each of the school's approximately 200 student in the school visited the NETmobile for approximately 25 minutes. The NETmobile staff worked

with the students to show them the capabilities of the Internet. The teacher commented on the impact of the Career Day Expo, “It was more than a field trip because the students would take their knowledge back with them of the careers available. And also the NETmobile showed students the most advanced Internet capabilities available and allowed students were able to tap into its vast resources.” The NETmobile staff added, “The kids loved it. In fact, some students asked about attaching a satellite on the roof of their school because they wanted to have that type of access available to them all the time.”

School-sponsored seminars for teachers also used the NETmobile. These have helped teachers understand the capabilities of the Internet. One of the local high schools is currently setting up a LAN for classroom usage and some of the teachers are trying to advance their understanding of the technology. The NETmobile has helped to jump-start some of the schools that have been falling behind in the age of technology. Some schools have passed bonds to upgrade technology portion of the school. Teachers that haven’t experienced the Internet have an opportunity to visit the NETmobile and learn about the benefits of the Internet so they can be prepared for technology advances in their schools. Another teacher developed a web page to sell instructional booklets on teaching student testing. They were able to sell more with help from the CoSERVE graphics department.

The NETmobile impacted other areas of the community. The success stories were few but promising. One businessman was inspired to develop his own web page to promote his calibration business after visiting the NETmobile. Since launching his web page, he has received business from customers in Virginia, Brazil, and Germany who found out about his company on the Internet.

The first day of our site visit took us to the rural community of Robstown, a population of 12,400, which is 91 percent Hispanic. Unemployment has continued to rise after the closing of one of the major manufactures in 1996. Although 50-60 percent of the people that were laid off were retrained, and some drive to Corpus Christi for employment, still others do not have jobs. The major employers are GTE and Northwest regional hospital. Robstown is approximately 2 hours from UTPA, and the town’s economic bureau of area development requested the NETmobile visit. The Robstown staff hoped the NETmobile would attract business owners to come and learn about the benefits of the Internet. Notices and faxes were sent to 76 business owners to inform them of the NETmobile visit. Several business owners and local residents visited the NETmobile and learned about the Internet

The NETmobile has been employed at conferences held by the UTPA Small Business Development Center (SBDC). A typical conference has over 100 participants, including business owners and government officials. The NETmobile was reported by an official of the SBDC to be “one of the biggest draws during the conferences.” The Employers’ Business Administration Expo was another SBDC platform in which the NETmobile was used to demonstrate the advantages of the World Wide Web to the local business community. This conference allowed top federal and local government officials to meet with small business owners to discuss issues and concerns. The SBDC plans to continue to employ the NETmobile in the future for conferences and perhaps to provide work training seminars that teach business leaders how to use computers.

Another targeted group was local and regional government officials. The NETmobile traveled to several chambers of commerce to promote the use of the Internet. Many rural communities in South Texas do not have Internet access, and many wanted to learn and understand how it can be used to communicate and obtain information.

Impact of the Project on Other Beneficiaries and/or the Overall Community

As the NETmobile travels to different schools to educate students, it has also helped to develop relationships between schools and the university. The high school teacher who organized a Career Day Expo at his school felt the partnership with the university had been good and would continue to develop. Since the Career Day Expo, other departments at his school have requested a NETmobile visit and demonstration. Another benefit resulting from the NETmobile's efforts to expose students to the Internet and advanced technology is that information and enthusiasm about the Internet often extends into the students' homes, thereby reaching the parents.

The NETmobile works with Small Business Administration and the Federal Empowerment Zones through the One Stop Capital Shop, which has three offices in the Rio Grande Valley. The One Stop Capital Shop is a nationwide project that helps communities access and use economic development resources and opportunities. Two business seminars that will employ the NETmobile to introduce participants to the Internet are currently being organized in Edinburg by the One Stop Capital Shop. The NETmobile has also been used to help link the organization's satellite offices during training sessions on using the World Wide Web.

Impact of the Project on Grant Recipients and Project Planners

The NETmobile project was the start of a relationship between the University and Hughes Electronics. As previously mentioned, Hughes has extended their contribution of free satellite time and has assisted in solving satellite-related difficulties that the NETmobile has encountered. Hughes has expanded the relationship by recruiting students from the UTPA engineering department. To date Hughes has employed five UTPA students. Another project partner, Southwestern Bell has received requests from several schools to establish Internet connections after being exposed to the Internet via the NETmobile.

And UTPA itself has benefited from the NETmobile project. During the site visit, most of the NETmobile staff were preparing for the dedication of the school's new International Technology (IT2) building. The multi-million dollar building was funded with a grant from the U.S. Department of Commerce's Economic Development Administration. A major function of the building is to provide high-quality teleconferencing services with Mexico. The school's reputation as being at the leading edge of the technology and telecommunications revolution was a significant factor in receiving funding for the building and can be partially attributed to the NETmobile project.

Project Goals Not Met

None.

Impact of TIIAP Support on the Initiative

The TIIAP financial support from the Department of Commerce provided credibility to the project that the UTPA staff felt was absolutely critical for getting Hughes on board. Without the TIIAP funding and Hughes' support, the NETmobile project would never have been attempted.

F. EVALUATION AND DISSEMINATION

Evaluation

NETmobile staff originally projected that 4,000 people would visit the NETmobile during the grant period. By the end of the grant period, project staff had documented that 4,234 people had visited the NETmobile.

Prior to project implementation, a limited amount of survey data was collected from the schools located in the Rio Grande Valley Rural Empowerment Zone. The data collection effort was designed to help NETmobile staff understand the technology needs of the schools in the empowerment zone. The data obtained helped NETmobile staff determine the Internet capabilities currently available at the schools and the students' levels of computer and technology literacy. The survey results were used by NETmobile staff to develop an appropriate presentation at teach school that was visited. No followup data have been collected to determine the impact of the NETmobile visits on the schools.

During our visit, staff discussed plans for conducting more extensive evaluations but nothing had been implemented. Plans to develop a survey for visitors to complete upon exiting the NETmobile were being considered as a possible evaluation activity.

Dissemination

All sites that request the NETmobile are responsible for advertising the NETmobile visit. Consequently, numerous articles about the NETmobile have been published in publications such *as The Voice of Hispanic Higher Education*; Dell's *WorldWide News*, and other local newspapers and periodicals. In addition, several sites created and disseminated brochures and advertisements to assure good turnout. An article was printed in a German magazine after an exchange student who had worked with the NETmobile project returned to Germany.

Academic presentations on CoSERVE and the NETmobile have been given to faculty at the university, students in the local public schools, and community and government officials. The NETmobile has also been showcased at conferences and other events. Getting out into the communities is considered by project staff to be the best way to make people aware of the NETmobile and its capabilities.

Potential for the Project to Serve as a Model

Despite the innovative and advantageous qualities of the NETmobile's approach to stimulating information infrastructure usage, project staff are not aware of any attempts to replicate the NETmobile. Upon being referred by Hughes, Hewlett-Packard, and Allstate held discussions with NETmobile staff because they were interested in doing a similar type of project to bring Internet access to inner-city students in Chicago. Officials with the U.S. Border Patrol also expressed an interest in the satellite technology used on the vehicle. And a consortium of schools in Eastern Texas met with project staff to discuss the pros and cons of the NETmobile's satellite linkage system. NETmobile staff have not heard of any progress being made on any of these projects.

G. LESSONS LEARNED

More time at the start of the project would allow for more research into technology options and would allow more time for 'debugging' the satellite programming. Ample planning time is especially important with prototype projects such as this one.

Strong and active partnerships are crucial to the success of the project. Establishing good working relationships and reciprocal agreements with project partners early in the project were critical to the success of the NETmobile.

Careful attention to the little things can avoid most problems. For example, early in the project, the NETmobile's original generator would unexpectedly stop in the middle of the presentation because it was not powerful enough to support the power needs of the computer, telecommunications, and air conditioning equipment. In order to ensure uninterrupted service, a more powerful diesel generator was installed. And a second air conditioning unit was installed to ensure an ambient temperature inside the trailer while doing presentations.

H. FUTURE PLANS

NETmobile staff plan to continue to provide Internet services to businesspersons, government, and schools in the Rio Grande Valley. Other plans for the future use of the NETmobile are dependent on receipt of a grant from Fannie Mae to establish a housing collaboration at UTPA in which the NETmobile would travel to housing fairs. With software provided by Fannie Mae, the NETmobile would be used help people learn about purchasing a new home, determine eligibility for home financing, and communicate with mortgage officers and real estate agents. If the university receives the grant, the NETmobile has committed to six visits a year over the course of 4 years. The Proshare units would play an integral role in the Fannie Mae project by providing video-conferencing capabilities.

The staff has discussed creating a second NETmobile that would specialize in providing video-conferencing services throughout the region.